Small-scale Forestry (2007) 6:233–255
DOI 10.1007/s11842-007-9025-z

RESEARCH ARTICLE

Policies Affecting Forestry Entrepreneurship

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Accepted: 2 July 2007 / Published online: 10 August 2007

Abstract Many demand and supply-side policies *impede* or *foster* forestry entrepreneurship. A study was conducted to consolidate existing knowledge on policies influencing forestry entrepreneurship in Finland, Norway, Japan, Australia, the Philippines and the USA, and to draw conclusions on these impeding and fostering factors. From the country studies it was difficult to find common structures on policies affecting forestry entrepreneurship. This is understandable because most policies in forestry are aimed at supporting sustainable forest management, wood production and ecological services of the forests rather than entrepreneurship as

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such. Despite the high variety of policies applied in the study countries, it can be concluded that strict public control on forests' use and management potentially impedes forestry entrepreneurship. While these policies assist to correct market failure and to promote sustainability of forest management, they may also result into unnecessary and ineffective regulations that limit the opportunities for forestry entrepreneurship. A common feature promoting the demand for forestry entrepreneurship in some of the countries studied is the strong emphasis on forestry cooperatives, which were important institutions to support small-scale forestry entrepreneurship. In many study countries, different ad hoc programs are implemented to find new economic and entrepreneurial opportunities aside from the current use of wood and forests. Subsidies and tax incentives are commonly applied to reduce risks from making forestry investments or otherwise increase the economic return from timber production.

Keywords Innovation · Investment opportunity · Policy · Regulation

Entrepreneurship and Economic Development

In the analysis on the relations between firms and markets, renowned economist Alfred Marshall (1842–1924) separated internal and external economies. External economies related to economic development at the industry level, whereas internal economies focus on resources, organization and management efficiency at the firm level. Growing interest in internal economies at the end of the 19th century led to increased attention of economists on firms and their cost minimization and innovative behaviour (Lahti 2005).

Back in the 1910s, Austrian economist Joseph Schumpeter (1883–1950) explained the importance of new firms with entrepreneurial spirit in displacing less innovative firms in markets, which ultimately leads to a higher degree of economic growth. In this context, the role of entrepreneurs is to reform the pattern of production by utilizing untried technology for producing a new commodity, producing an old product in a new way or introducing known products in new markets.

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The importance of entrepreneurship increased in capitalistic societies through the 20th century. After the collapse of communism in the 1990s, entrepreneurship has become an even more important engine of economic and social development throughout the world.

The definitions of entrepreneurship vary according to the perspective or emphasis. From an economic perspective, entrepreneurship includes decision-making on supply of financial capital, innovations, and allocation of resources among alternative uses (Hebert and Link 1989). From the management perspective, entrepreneurship is a way of managing that involves pursuing opportunities regardless to the resources currently controlled (Sahlman and Stevenson 1991). Another definition views entrepreneurship through the perception of new economic opportunities: entrepreneurship is to identify and pursue new opportunities that can succeed in the markets (Audretsch 2002).

In this article, entrepreneurship is defined as the process of transformation of new opportunities into values in markets. This definition emphasizes not only the innovative nature of entrepreneurs (in searching for and implementing new opportunities), but also the ultimate control of markets, where the success or failure of entrepreneurs is measured.

Beside the question on how to improve prospects for entrepreneurship, the question of rural development has been on the political agenda for decades. Despite some advantages of rural areas, including low land price, attractive environment for living and housing, and sometimes low labour cost, many disadvantages often restrict financially viable development in rural areas. From the enterprise development point of view, especially, rural areas are often at a disadvantage compared to urban areas.

Globalization and the birth and growth of the so-called *information society* have widened the gap between rural and urban areas. Urban areas provide better facilities for enterprises to succeed due to knowledge accumulation. Other disadvantages of rural areas are that they provide fewer opportunities for skilled labour and less non-traded inputs to industries than urban and semi-urban areas (Hyttinen et al. 2002). Rural characteristics may be a clear disadvantage also for forest-based enterprises and their possibilities to compete for skilled labour, capital and knowledge. An additional disadvantage for forest-based enterprise development is that entrepreneurial thinking and managerial skills are underdeveloped in many parts of the forest-wood chain, e.g. in forest management, wood contracting and utilization of various non-wood forest products and services (Niskanen 2005a).

Even though forestry is not—and should not always be—considered as an entrepreneurial activity, many policies are nevertheless designed to change the behaviour of forest owners through economic means. These policies include subsidies for tree planting, silviculture and soil improvement, which increase the forest owner's profit or decrease their risk when investing in forestry. Though not always explicitly considered, these policies affect the demand and supply of entrepreneurship in forestry through their impact on forest owners' decision-making.

The aim of this article is to consolidate existing knowledge on policies influencing forestry entrepreneurship in Finland, Norway, Japan, Australia, the

Philippines and the USA, and draw conclusions on the impeding and fostering factors on forestry entrepreneurship.

Framework for Analyzing Forestry Entrepreneurship

In small-scale forestry, forest owners' seldom consider themselves as entrepreneurs. Nevertheless, they often have economic motives in managing their forests and in principle they could be considered as owners of micro-enterprises. Many public policies may impede forest owners' decisions to act as entrepreneurs. Entrepreneurship may be considered as a *factor of production*, for which a market exists and hence for which various forces influence the supply and demand of this factor. The *demand* side policies (see Fig. 1 and Table 1) impeding forest owners' opportunities for entrepreneurship include policies increasing regulations on forest management and policies forcing forest owners to provide various public services thus leaving less space for their own decision-making. Privatisation of public forest services and promotion of forest farm linkages through forest owners associations, on the other hand, may support forest owners' business opportunities.

The most prominent business opportunities for small-scale forest owners normally exists in wood production, but increasingly opportunities also arise in the production of non-wood forest products and in the provision of forest-based services, e.g. in the form of nature-based tourism. Sometimes there are severe barriers for forest owners to develop their entrepreneurial activities. For example, if the demand for wood is low compared to the forest growth, it is difficult to develop businesses on wood production alone. As a comparison, if the demand on recreational or amenity services is low, as may be the case in remote and inaccessible rural areas, it may be difficult to find viable opportunities for a business in services. If the demand for wood as a source of bioenergy is high, but the industry's ability to pay for wood for that purpose is low, this again provides little opportunities for forest owners' business developments. Many non-wood based products and services might give business opportunities to people other than forest owners.

Often the demand for intangible services—such as landscape amenity or protection against noise—and for non-marketable assets (e.g. biological diversity) is

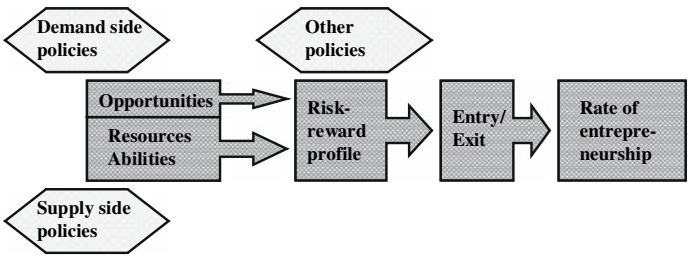

Fig. 1 Structure of policies affecting forest sector entrepreneurship (modified from Audretsch 2002)

Table 1 Examples of demand-side policies that elaborate entrepreneurship in small-scale wood production, forest-based services and non-wood forest products (Niskanen et al. 2007)

Policy focus	Small-scale wood production	Production of forest-based services and non-wood forest products
Deregulation or stimulation of the entry in the markets	Policies supporting joint-forest ownership and the formation of larger forest ownership units.	Policies supporting hunting tourism through the permission of fishing or hunting licenses on public land.
Privatisation of public services	Policies that lower the barriers for private enterprises to engage in services traditionally provided by a public actor, such as forest management planning.	Policies that help to control public access on land to support tourism. Regulations to control common access on non-wood forest resources.
Promotion of farm linkages	Policies supporting the formation of and work in forest owners' associations.	Policies supporting networking, joint marketing and efforts to build-up non-wood forest product producers' associations.
Elaboration of the access to global value chains	Promotion and development of forest certification schemes.	Marketing campaigns on public image of particular regions or areas.
Creating markets		Policies supporting carbon sequestration trading.

high, but the opportunities for new entrepreneurial activities remains low. Without the creation of markets where the demand and supply of forest goods and services are able to meet, opportunities for entrepreneurial activities are minimal.

The *supply* response with regard to enterprise development and entrepreneurship depends on the resources and capabilities of individual forest owners, their attitudes and networking abilities, as well as on the cultural and institutional characteristics of their surroundings. In Norway, for instance, small-scale forest owners have only a minor part of their income from forestry and as because the demand for labour market is high, they have no need to be entrepreneurial concerning the use of forests. Any of the policies increasing the opportunities for entrepreneurship illustrated in Table 1, cannot be efficient, if there are not enough resources and capabilities among individual forest owners to take the advantage on the opportunities.

Though to become an entrepreneur or to develop existing businesses is an individual choice for a forest owner, it still can be affected through the implementation of various policies. In small-scale forestry, improved education and training can help forest owners to develop and operate their forest-based businesses, as can improved access to credit—which decreases the personnel risk of forest owners in developing their businesses. Supply-side policies designed to improve the prospects for forest-based entrepreneurship, such as public promotional campaigns, and institutional factors (including the level of forest taxation) also directly affect the supply of entrepreneurship (Table 2).

In principle, both demand-side and supply-side policies affect the risk and rewards of individuals and firms, and the outcome from decisions to invest on

Table 2 Examples of supply-side policies that elaborate entrepreneurship in small-scale wood production, forest-based services and non-wood forest products (Niskanen et al. 2007)

Policy focus	Small-scale wood production	Production of forest-based services and non-wood forest products
Promotion of resources and capacity of forest owners	Education and training of forest owners for forest management, timber harvesting and wood sales.	Policies supporting the establishment of business, e.g. public or subsidized credits and other supporting tools or incubators for evolving business ideas.
Facilitating access to resources	Regulations to secure long-term wood supply and subsidies to increase forest growth.	Provision of information on the predicted growth and yield of various non-wood forest products.
Improving the views on entrepreneurship	Promotional campaigns, education, support of networks, research on forestry entrepreneurship.	Promotional campaigns, education, support of networks, research on service entrepreneurship.
Institutional factors	Policies affecting the administrative level burden and the degree of taxation.	Policies affecting the administrative level burden and the degree of taxation.

enterprise development or to enter into new entrepreneurship (Fig. 1). Beside the demand- and supply-side policies, there are often other policies that directly change the *risk and reward profile* of small-scale forest enterprises. These policies—including general tax policies, subsidy policies, labour market rules and heritage rules—which are seldom designed specifically for small-scale forestry also affect the entry and exit of forest owners in relation to entrepreneurship.

Policies Affecting Entrepreneurship in Forestry: Country Profiles

Finland: Demand-side Policies

The rate of formation of new enterprise initiatives in small-scale forestry (or non-industrial private forestry, NIPF) is low in Finland. Although the number of small-scale forest holdings is high (about 440,000), few of them include types of businesses other than farming or forestry. The NIPF business environment is characterized by dominance of large-scale forest industries, with only a few major timber purchasers, hence new business activities in forestry are not widely explored. The main emphasis is to improve the effectiveness of existing processes in forestry (Aarne et al. 2005).

Forestry in Finland is largely implemented under strict public control. The *Forest Act 1093/1996* and the *Nature Protection Act 1096/1996* describe the principles for forest management and nature protection (Aarne et al. 2005). Though they build a cornerstone for sustainable management of forests, they also strongly regulate forestry by setting minimum standards for forest management and forest protection, as well as standards for wood harvesting. As a result, most forest owners follow rather similar forest management practices, though the owners' objectives differ considerably.

Income and economic security are reported as main objectives for one third, and recreation for one fifth, of forest owners; the remainder aim for income and recreation simultaneously (Karppinen et al. 2002). The regulations and norms on forest management may constrain the behaviour of especially those forest owners who are business oriented. The lack of opportunities outside the wood production regime probably demotivates entrepreneurial thinking of, for example, the recreation-oriented forest owners.

Forest owners' associations help small-scale forest owners in their forest management decisions, and play an important role in supporting forestry entrepreneurship, especially in wood production. Recently, there has been discussion, however, about whether the obligatory fee that these associations are allowed to collect from forest owners unnecessarily regulates the markets. The fee has been seen as a barrier for private forest management services to develop (Kolström and Harstela 2005).

Regional forest centres, the main duties of which include control the implementation of the forest law at the local level and promotion of sustainable forest management, are semi-public forest organization under the Ministry of Agriculture and Forestry. Despite their public sector characteristics, regional forest centres also conduct planning in forest management, ditching, and forest road construction and maintenance. It has been discussed in the case of forest centres if the public funding for law enforcement and extension is used for supporting also these planning works, and if so, whether the public funding to forest centres impedes private forest service enterprises from succeeding in the markets (Kolström and Harstela 2005).

The Finnish Government in 2002 initiated the so-called Forest Biodiversity Program for Southern Finland 2003–2007 (called the METSO program), which aims to protect forest biodiversity by compensating owners for voluntary forest protection. One example of the new instruments developed under the METSO program is that forest owners can now offer forest land for protection together with a request for compensation. The offers are compared and the most cost-efficient bids are accepted for funding. The new arrangements for forest protection are based on market transactions, and therefore can be considered to increase possibilities for entrepreneurship among forest owners.

In general, the demand-side policies in forestry support especially sustainable wood production in small-scale forestry rather than forest entrepreneurship per se. This latter focus is logical, because the main aim of these Finnish policies in to support sustainable forest management, rather than entrepreneurship in forestry.

Finland: Supply-side Policies

The majority of Finnish forests are owned by small-scale forest owners (53%), followed by the state (34%) and forest industry companies (8%). The remaining area (5%) is owned by municipalities or parishes, or jointly owned by a group of private forest owners. The average size of small-scale forest holdings has decreased since the 1970s. To increase the efficiency and economic orientation in decision-making, the Ministry of Agriculture and Forestry is planning a specific program to support joint ownership of forest estates. An increase in the number of jointly owned

forests is expected to improve also the entrepreneurial activeness of small-scale forest owners, although science-based evidence on this is lacking.

Forest research in Finland is conducted in the Finnish Forest Research Institute (Metla), at several other smaller research institutes and at two universities. In general, forest research is diverse and of high quality, and definitely helps forest sector administration, forest owners representatives such as the Central Union of Agricultural and Forestry Producers, as well as private forest companies. The main problem from the point of view of entrepreneurship is the lack of development work that could lead to new entrepreneurship in forestry and forest consulting services (Niskanen 2005b).

According to Aarne et al. (2005), several research and development (R&D) programs have been implemented since the 1990s to support wood-processing innovations. These activities, commenced through independent projects, have gradually developed into the activities with accompany permanent networks of R&D and educational institutions. In general, the supply-side policies such as the special R&D programs that help the development of entrepreneurship are much less visible in forestry than in wood processing.

Change in the Risk Reward Profile in Finland

One major policy to support small-scale forestry in Finland is the scheme whereby small-scale forest owners are eligible for state support in forest generation under specific circumstances, prescribed burning, tending of young forests, harvesting of energy wood, forest remedial fertilization, renovation ditching and forest road improvement and construction. State subsidies are mainly aimed at increasing the financial attractiveness and decreasing the risk of forestry investments, thus directly promoting forestry entrepreneurship.

Norway: Demand-side Policies

Forestry in Norway is regulated under the *Forestry Act of 2005* (Ministry of Agriculture and Food 2005), which applies to all categories of ownership, and is based on the fundamental principle of freedom with responsibility for the individual forest owner. The provisions include principles related to environmental and recreational considerations, forest road construction, forest management, protective functions and the Forest Trust Fund. Minimum standards are set for forest management and this is controlled by the forest extension service.

The forest owners are obliged to allocate a fixed percentage of the timber sales to the Forest Trust Fund, each forest owner having an individual account in the fund. The funds are used for investments in silviculture, forest management planning, forest production, forest road works and measures aimed at securing important environmental values in the forest. The interest on the deposits from the Forest Trust Fund is used for administration of the scheme, which is a joint effort between the forestry extension service and Norwegian Federation of Forest Owners. Currently, forest owners receive tax benefits when using the Forest Trust Fund. The Ministry of Agriculture and Food issues regulations about the fund, and details may change

from year to year. Allocations shall not be less than 2% of the gross value of the timber. There is some discussion about using money from the fund for formation of new enterprise initiatives, but this is not possible at present.

Norway has a tradition for cost-share programs, which together with the Forest Trust Fund have been important to assure that sufficient investment is undertaken in forestry. The economic efficiency of the cost-share programs has been questioned and during the last decade there has been a considerable cut in those programs (Baardsen 1991; Ministry of Agriculture and Food 2006). In the last years there has been a concern that the annual log cut has decreased. The annual growth is estimated to 28 M m^3, with annual removals of been between 8 and 11 M m^3 (Vennesland et al. 2006). A new program with incentives for forest owners to increase their cut was introduced in 2007 (Ministry of Agriculture and Food 2006). The main elements of this program are increased tax incentives by using the Forest Trust Fund, provision for the fund to be used to finance bioenergy initiatives, and greater financial support for cost-share programs in marginal areas.

In the past, it has been difficult to purchase forest land in Norway. An important policy change during the last years has been that forest properties smaller than 10 ha can be sold in the free market without any public regulations (Ministry of Agriculture and Food 2003), making it easier for entrepreneurs to purchase forest and develop their business ideas.

Stimulation of entrepreneurship has traditionally not been a goal of forest policy and most of the policies can be said to have negative rather than a positive impacts on forestry entrepreneurship. During recent years, entrepreneurship has come on the political agenda and there are examples of policy changes where entrepreneurship has been mentioned as a driving force. In the latest forest policy document there is a separate section on innovation policy and this indicates a direction of change (Ministry of Agriculture and Food 2006).

Scholarships are available for people who want to start up new activities in relation to farms including forest-related activities. To be awarded one of those scholarships, one has to attend entrepreneurial training given by Innovation Norway. During this training a business plan for the new activity is usually made; Innovation Norway might also provide some financial support to the new activity.

Norway: Supply-side policies

About 78% of the Norwegian forest area is owned by small-scale forest owners; 75% of these owners live on the property and the majority of these properties are managed together with agriculture. This means that the development in agriculture has a large impact on what is happening in the forest. The main goal of Norwegian regional policy is to maintain the current structure of the population pattern. Employment has steadily decreased in traditional agriculture and forestry, and there has since the beginning of the 1990s been a large public program to support new business initiatives in agriculture and forestry. There are indications that new businesses perform better if involved in local and national networks (Vennesland 2004a), and public support to the creation of networks is part of policy.

There is also evidence that owners with entrepreneurial attitudes (opportunity recognition, and risk tolerant attitude), have a higher start-up probability (Lunnan et al. 2005). There is some evidence of a considerable learning effect when people start up some new activity. This might be the most important effect of the cost-share programs to new businesses in agriculture and forestry. There are indications of serial entrepreneurship and people continuing to new and more profitable business ideas, using the insights they gained from their first start-up (Vennesland 2004b).

The policy means to support the supply of entrepreneurship in forestry in Norway are public subsidies, subsidized credit, public and private extension service, and development programs for special sectors (including tourism, small-scale wood development, small-scale hydropower stations and bioenergy). Rural tourism especially is a growing field, and utilization of forests and outfields is highly important in this respect. The forest owners' associations have built up commercial organizations to promote rural tourism and cooperate with Innovation Norway to market their services abroad. They also cooperate with various public programs to improve their services (Nybakk et al. 2005).

Change in the Risk Reward Profile in Norway

The difference in time preferences between private forest owners and society in general is the main reason for public policies to stimulate long-term investments in forestry. The Forest Trust Fund is the most important forest policy instrument in this respect in Norway.

Japan: Demand-side Policies

There are three major pieces of legislation dealing with forests and forestry in Japan. The *Forest Law, 1951* is the main one, with strong regulatory power in general forest management issues. It defines the forest, protection forest scheme, and national forest practice plans. The *Basic Forest and Forestry Law, 2001*, which is the amendment of *Basic Forestry Law, 1964*, is a declaratory act for national forest policy direction. The law of 1964 strongly assisted promotion of forestry activities based on individual forest owners, but the present law emphasizes environmental functions of forests rather than the production function. The *Forest Owners Cooperative Law* provides a legal framework for forest owner cooperatives, which is the main form of organization to integrate small-scale forest owners in rural areas (Ota 2002a).

Japan is relatively rich in forest resources. Total forestland area is 25 M ha, including 10 M ha of softwood plantations. The growing stock in Japan is about 4 billion m^3, and it is increasing rapidly because of a low rate of harvesting. Timber production volume was more than 50 M m^3 per year during 1960s, but is now only about 16 M m^3 per year. A free trade policy on timber products has facilitated the flow of logs, timber and wood chips from other countries to Japan for decades (Forestry Agency 2006).

About 58% of forestland is privately owned, with about 2.5 M forest owners holding more than 0.1 ha of forestland. Most private household forestlands are very

small, the average size being only 2.7 ha. Because forestry is one of the main economic activities in rural mountainous areas, the central government has provided grants to local municipalities in proportion to forestland area (Forestry Agency 2006).

Japan: Supply-side Policies

Supply-side policies are rather weak compared with the demand-side policies in Japan. However, with the growing concern over decreased number and ageing of forest workers, both state and local governments have began to consider effective means for supporting the number of young forest workers.

Having some previous successful examples in prefectural level trials, the central government launched the 'Green Employment: Forest Worker Training Project' in 2002. This project is based on the *Basic Forest and Forestry Law, 2001*. With the help of the public and private sectors, such as prefectural government, municipal government, forestry cooperatives and forestry enterprises, the central government facilitates new employment in forestry works.

Consulting meetings are held in 20 cities every year, and thousands of provisional forest workers gain work experience in forestry by using the project subsidy for up to one year. The majority of such workers are drawn from urban areas, but have a desire to live in more natural environment and are interested in forestry.

Prefectural governments also have many kinds of rural development measures. A typical successful example is the 'One Village, One Product' movement in Oita Prefecture, which commenced in 1979 (NIRA 1987). The prefectural governor advocated this movement with the principles of local products but global acceptance, self-supporting organization, and development of local human capacity and know-how. In this program, a key element is to create sophisticated products using local resources. Bottom-up activities are emphasized and the government has supported the sales of developed products by advertisement as well as the related capacity and know-how development. Most of the products developed so far have been from the agricultural sector, but some products are from the forest sector, including wood craft and bamboo products, charcoal and other non-timber forest products.

The central government has a strong policy to support rural forestry activities in Japan. The 'Forest Structure Improvement Program' based on the *Basic Forest and Forestry Law* is the main engine for implementing this policy in rural regions throughout Japan. Enhancement of the stability of economic activities in small-scale forest holdings is one of the major purposes of this policy.

Under the 'Forest Structure Improvement Program' the National government subsidizes 50% of total expenditure, prefectural government 25%, municipal government 10–15%, and the rest is to be paid by the organization implementing special tasks under this program. Private companies and individuals are not eligible for these subsidies, but cooperative organizations including forest owners' cooperatives and sawmillers' cooperatives are. In most cases, existing forest owners' cooperatives or newly created local sawmillers' cooperatives are accepted

to receive the program subsidy. Municipalities (towns and villages) are also eligible for the subsidies.

In terms of eligible activities for subsidy under this program, the central government provides a common list of activities, including forest road construction, road maintenance, processing factory construction, sawmill machinery purchase, parking lot construction, forestry machine purchase and building construction. With the growing importance of forest recreation activities, a number of recreation facilities (including camping grounds, cottages, barbeque spaces, forest trails, information centres and athletics fields) are also accepted as eligible for subsidies. Hundreds of organizations have received Forest Structure Improvement Project subsidies since 1964.

Change in the Risk Reward Profile in Japan

In Japan, there also are several forestry practices subsidies for private tree growers. Plantation establishment with softwood and hardwood species, weeding, and pre-commercial and commercial thinning, are examples of the forestry practices that can be subsidized. The rate of subsidy is usually up to 68% of the total costs to the forest owner (Ota 2002b). Forest owners receive the subsidies through local forest owner cooperatives. In other words, forest owner cooperatives play an important role for the governmental subsidy policy in Japan.

Tax exemption for forest production is another governmental policy regulating private forestry. Income from timber sales in one year may be divided equally through the next 5 years, in order to lower the rate of progressive taxation.

Australian Demand-side Policies

There are about 50 M ha of forests that are potentially productive for timber and related products in the tall forest areas in Australia. This is held approximately 23% in state-owned conservation reserves, 22% in state-owned multiple-use forests (including wood production), 40% in private ownership and 15% in state-owned but privately leased forest (generally pastoral use). Softwood plantations in 2005 covered 1.0 M ha and hardwood, 0.7 M ha. Plantations are responsible for over 60% of domestic log production. About 45% of softwood plantations and 90% of hardwood are privately owned.

Until the 1970s the Commonwealth government had little role in forest policy and management. Since then, the growing demand for conservation of native forests and the attendant controversies between conservation and wood production, and between the individual states and the Commonwealth, have had a marked though indirect impact on entrepreneurship. Increasingly, the Commonwealth has sought to exercise an influence over the state control of forests, culminating in the initial development of a joint National Forest Policy Statement (NFPS) in 1995 (Commonwealth of Australia 1992/1995). The NFPS established 11 national goals that seek to integrate environmental and commercial objectives for publicly and privately owned forests. In addition to measures to improve standards of forest management through mandatory codes of practice and plans of management, the

expansion of the plantation base for wood production represented a major thrust to substitute progressively for that from native forests.

Implementation of the NFPS was slow initially until a system of Regional Forest Agreements (RFAs) was initiated in 1996, involving detailed regional agreements relating to land allocation in native forests and associated industry development (Brown 2002) between the States concerned and the Commonwealth. The RFAs were designed to provide resource security for the Australian forest industries, a national conservation reserve system, and continuous improvement in ecologically sustainable management. While RFAs exhibited a number of innovative features in terms of defining social, economic and environmental conditions, they have had mixed effects on Australia's native forest industry (Slee 2001). As a result of resource withdrawal, many areas of Australia are unable to support previous levels of native timber processing. The Commonwealth government introduced a $150 M Forestry Industry Structural Adjustment Package to provide assistance for workers and those businesses made unsustainable, together with assistance for remaining businesses to encourage investment in value-adding. This package was further supported by cash contributions from some state governments.

The effect of these policies on entrepreneurship and investment in the native forest industry was initially negative, as native timber resources shrank. More recently, the progressive shift to corporatisation of native forest management, higher stumpage prices, and changes in the supply of imported timbers have encouraged entrepreneurship and innovation in further processing and value-adding to take advantage of the special properties of native timbers.

Australian Supply-side Policies

Prior to the early 1990s most plantations were of exotic softwoods, chiefly *Pinus radiata*, and were established by the respective states or territories. Since then, much of the softwood plantations in two states have been sold to private interests such that about 40% of the total is now privately owned, 5% is in joint private/public ownership and the remainder public. The remaining public agencies have generally been transformed into more commercial state-owned corporations. While these changes have engendered a more entrepreneurial system in industrial forest-growing, the major change has occurred in the hardwood plantation estate.

The hardwood plantation estate expanded rapidly from a very small base in 1990 to over 0.7 M ha in 2005. This increase is largely due to the introduction of Managed Investment Schemes (MIS) by the Commonwealth government, partly to support the shift to plantations proposed in the NFPS and partly to assist structural adjustment of small-scale agriculture. MIS enable companies to raise funds from individual taxpayers through the issue of prospectuses. The taxpayers are for the most part attracted by the ability to claim the investment against their taxable income in the year of investment. These schemes now dominate the establishment of new plantations in Australia. Until recently, most have focussed exclusively on the establishment of eucalypt plantations (mainly *Eucalyptus globulus*) under 10–15 years for pulpwood production, the short rotations being more attractive to

most of these investors, as well as to lessees of the land where it is not purchased outright.

A number of entrepreneurs have formed MIS companies for investment in plantations on cleared agricultural land. The MIS system provided the ability to harness and financially manage investment in extensive industrial plantations on behalf many small investors and to so enjoy economies of scale and scope. Also, the expectations of a relatively low return on investment by individual MIS investors (on funds that would otherwise have gone to paying tax) has encouraged more intensive and risk-reducing investment in establishment and tending than might otherwise have been possible. Some of the companies have innovated and developed successful techniques to assess soil productivity and increase stand growth rates. These companies are likely to continue to innovate as harvesting and domestic export marketing of the fast-grown plantation species are developed over the next decade or two.

The National Forest Inventory (2003)—a partnership between the Commonwealth and State Governments to collect and communicate information on Australia's forests—provides information on plantation areas and projected wood flows (Ferguson et al. 2002). A number of Australian regions have developed outlines of possible investment opportunities, and strategies for infrastructure and industry development, to assist entrepreneurs in their investment decisions.

Under its charter within the NFPS, the Forest and Wood Product Research and Development Corporation has funded a range of research relating to wood production, extraction, processing, economics and marketing, with varied success (Bull and Ferguson 2006). The Corporation is funded through an industry levy supplemented by the Commonwealth government on an equal basis up to a fixed limit. It has been estimated that for every dollar invested, the prospective economic return to Australia is $28 (BDA Group 2002). In total, Australia spends approximately $70 M annually on forestry and forest-products-related research and development (Kanowski 2004), mostly towards improving growth and product recovery and processing efficiencies of softwood plantation and native forest timber. An increasing proportion will go to the hardwood plantation sector as the share of wood flows and hence levy funds from these plantations increase. The Corporation is shortly to be expanded to include a separate industry-funded promotion role.

Although most States and Territories have had their own programs to encourage and assist farm forestry and environmental revegetation, most have been ineffective in increasing wood production, partly because of the higher cost of small-scale plantations and partly because of crowding out of the market for wood products by the industrial growers, both public and private. 'Landcare' programs have been relatively successful in encouraging environmental re-vegetation.

In conclusion, Commonwealth and state forestry agencies and the forest industries have established a range of predominantly supply-side policies in Australia to increase investment in the industry. While the majority of these policies have been designed primarily to improve the sustainability and economic viability of the industry, rather than directly encouraging entrepreneurial activity, the role of the tax-based incentives under the MISs has been direct and especially important.

The Philippines: Demand-side Policies

There currently exists an almost total lack of effective demand-side polices that encourage entrepreneurship in forestry in the Philippines, with some existing policies arguably inadvertently discouraging such activities. Since the 1970s, the Philippines has shifted from being a major timber exporter to being a net importer. The forestry sector which has been traditionally based on the logging of native forests has contracted sharply and there is now a total ban on the logging of native forests in most provinces.

A number of regulations have been introduced to control illegal logging of native forests, most of which are administered by the Department of Environment and Natural Resources (DENR) but also with involvement of the Philippines National Police. In particular, there are requirements for planted trees to be registered before harvesting permits are issued and a harvest permit is a prerequisite for gaining a permit to transport logs. The effectiveness of these regulations has been limited, especially in remote upland areas. It is however apparent that these regulations are restricting smallholder and community forestry development and associated entrepreneurial activities.

The complex regulation and permit system used to control timber harvesting and transport, and lack of funding for the DENR to carry out field activities, has meant that tree registration has imposed costs on smallholders and discouraged tree planting (Herbohn et al. 2004). One effect of this is that small-scale farmers evade the regulations, partly by not registering their trees. They further reduce the potential to lose their investment by not investing significant resources into timber production, thereby ensuring that broadscale production does not occur. Most households appear to only grow enough timber for their own requirements, or to sell locally where they can avoid transport checkpoints.

Some smallholders sell their standing trees to timber merchants who take on the responsibility for gaining all the appropriate permits and approvals, along with all harvesting processing and transport operations. A lack of knowledge of the maze of regulations relating to harvest and transport approvals contributes to many smallholders being willing to accept low prices. In addition, many smallholders have little cash, and cannot afford to pay in advance for the harvest and transport of trees. Arrangements with merchants often involve no cash outlays on the farmers' behalf, with them receiving a residual payment from the merchant sometime after the trees are harvested. The stumpage prices paid by merchants appear to be low relative to the value of the timber, and do not encourage entrepreneurial activity. Poor education and low cash incomes thus act as a major impediment to entrepreneurship by smallholders.

The current circumstances favour entrepreneurship by timber merchants, who may also be timber processor or may act as middlemen. The entrepreneurial activities of merchants raises the issue of equity between the various participants in the timber value chain and highlights that entrepreneurial activity is not always positive. The development of entrepreneurial policies that promote formation of cooperatives or clusters of smallholders which undertake the harvesting and sale of

timber may dramatically improve returns to smallholders and at the same time address the issue of equity.

The Philippines: Supply-side Policies

The logging bans imposed in the 1980s mean that few opportunities exist for entrepreneurship associated with native forest logging. Since the 1980s, there have been efforts to establish a plantation-based industry. Initial efforts involved the establishment of large industrial-scale forest estates, often funded by loans from the World Bank and the Asian Development Bank. The establishment of these industrial plantations has met with limited success for a variety of reason, including resentment from local communities displaced from their lands.

The 1990s has seen a shift to community and smallholder forestry programs. A variety of programs have been introduced and these have recently been consolidated under the Community-Based Forest Management (CBFM) banner (see Harrison et al. 2004 for further discussion). In some areas in the Philippines, and particularly the southern island of Mindanao and the central Visayas, many smallholders planted gmelina with an expectation of high financial returns. These returns have failed to eventuate largely due to oversupply of local markets and low product quality (Herbohn and Harrison 2005).

There are a number of other supply-side problems limiting entrepreneurship by smallholders and communities in the forest sector in the Philippines. Most growers lack knowledge about appropriate silviculture and marketing practices at all stages of the production cycle from species selection through establishment practices, stand management (including thinning and pruning) and harvesting and marketing. Little information exists for growers, and sometimes the information that does exist is inaccurate or misleading. This is compounded by lack of understanding of the complex regulations relating to tree registration and harvest and transport approval. There is also some confusion within government agencies about the tree regulations, including with the DENR and the Philippines National Police.

The low educational status of many growers restricts access to information from DENR and other sources. In addition, DENR offices have severe budget constraints that limit their ability to provide information, and their budgets often do not include allocations for making field visits or even to reproduce extension materials for distribution. The lack of information and skills of smallholders has resulted in many tree farms producing only small volumes of merchantable timber of low quality and not suited to market requirements. This severely limits the ability of smallholders to undertake entrepreneurial activities.

Change in the Risk-reward Profile in the Philippines

The programs introduced under the CBFM banner and various NGOs associated with aid programs can potentially act to change the risk-reward profile. Financial assistance in various forms can help improve the financial viability of forestry for

smallholders and communities. Some programs have provided direct financial assistance to smallholders to establish trees, while others have provided assistance with livelihood payments and activities that help farmers to produce income while the trees are maturing.

The success of these programs has been mixed (see for example Estoria et al. 2004). Insecure land and tree tenure can act as an impediment to entrepreneurship. In the Philippines, as with many developing countries, problems exist with smallholders and communities achieving secure tenure (Herbohn et al. 2004). Recently however there have been a number of aid projects that started to help formalize land tenure arrangements and these are likely to have a positive impact on the willingness of smallholders and communities to enter into entrepreneurial activities associated with forestry.

In conclusion, substantial scope exists to improve the institutional framework which facilitates entrepreneurship within the forestry sector. This requires a two-pronged approach involving better implementation of current forestry policies such as tree registration and harvest permits, and a reappraisal of existing policies, such as imposing a complete logging ban on all native forests. A necessary prerequisite for entrepreneurship is secure rights to the benefits of entrepreneurial efforts. Secure tree tenure—which is the Philippines context means the ability to register, harvest, transport and market trees—is a critical ingredient for the development of a forestry industry and the associated entrepreneurship. A lack of secure tenure (both actual and perceived) for smallholders is arguably the major impediment to the development of forestry and entrepreneurship in this sector.

USA: Demand-side Policies

Policies affecting the management of NIPF land in the USA vary dramatically from state to state and even by county within states. The management of forestland and the harvesting of timber are governed primarily by state laws, although various federal laws also affect forest management. Washington State and California forest practice laws are among the most complex and restrictive in the country.

There are relatively few federal or state programs designed to promote forest entrepreneurship in the USA. Incentives are primarily limited to specific tax benefits designed to encourage reforestation of recently harvested land, and to reduce tax rates on the financial gains resulting from timber harvest due to the long payback period. Entrepreneurship-oriented continuing education programs are available to landowners through the extension system.

The extension system—which has a long history—is a federal program administered through the land grant universities in each state. Extension foresters offer a wide range of evening and weekend programs to NIPF owners at a nominal cost, designed acquaint them with all aspects of forestland ownership. Extension programs range cover basic ecology and management, timber sale procedures and harvest regulations and forest taxation. Although are well attended, these programs reach only a small percentage of owners, and an even smaller percentage attend entrepreneurship-oriented programs. Many owners simply are not interested or are

unwilling to commit the time needed to attend such classes. Some landowners also obtain management help from consulting foresters, particularly those who lack the time and expertise to undertake management activities on their own.

Forestry cooperatives have had little success in the USA. The wide diversity of ownership objectives combined with the tendency for forest parcels to change ownership at regular intervals, the strongly independent character of NIPF landowners and numerous other factors combine to make cooperatives an anomaly in the USA (Richenbach et al. 2005).

USA: Supply-side Policies

Nearly two-thirds of the approximately 243.6 M ha of forestland in the USA is privately owned. Private ownership includes land owned by the forest industry, other businesses and corporations, partnerships, Native Americans, and NIPF owners. The remaining forestland in the USA is owned by the federal, state and local governments. The largest proportion of land in private ownership is in the eastern states. Nationwide, NIPF forestland owners control 42% of the nation's forest land (Butler and Leatherberry 2004).

NIPF owners hold parcels of typically about 16 ha in area, and often pursue a number of objectives other than timber production, typically revolving around amenity, recreation and preservation values. These parcels also often serve as home or cabin sites. A small percentage of landowners—particularly with medium to large size parcels—actively manage their forests for timber production.

Even though NIPF owners pursue multiple goals, their land constitutes a major source of timber supply for the forest products sector. Currently, NIPF supplies 59% of the timber harvested in the USA on a volume basis (MacCleery 2002). Timber is often sold in response to the financial needs of the owner (e.g. for financing their children's' education) or when land changes ownership through sale or inheritance. This latter point is particularly important, given that the tenure of ownership is often relatively short. Not surprisingly, many landowners have only limited knowledge of the numerous laws affecting the management of their land. This was documented in a recent study of NIPF owners in Washington State by Creighton and Baumgartner (2005).

Change in the Risk-reward Profile in the USA

There is a long history of forestry incentive programs designed to encourage reforestation of marginal agricultural land in the USA. Under the Conservation Reserve Program (CRP)—a federal program for the retirement of farm land established in 1985—owners can receive annual rental payments and cost-share assistance to establish resource conserving cover on eligible farmland. Acceptable cover includes trees, grasses and other herbaceous cover reflecting the wide array of land types in the USA. The Commodity Credit Corporation makes annual rental payments based on the rental value of the land, up to 50% of the participant's costs

in establishing approved conservation practices. Landowner enrollment typically lasts for 10–15 years, after which they are typically offered the opportunity to re-enrol in the program. However, at the end of each enrolment period owners are free to return the land to agricultural production or convert the land to other uses.

The original intent of the CRP was the removal of marginal agricultural land from production; the reforestation of a portion of this land was simply a by-product of the original over-arching goal of the program. The wide arrange of monetary and non-monetary benefits resulting from this program is difficult to fully assess, particularly given the fact that land continues to enter and leave the program. However, the CRP is widely believed to have a strong positive affect on the environment.

Forest landowners may also apply for funds through the federally funded forestry incentives program (FIP). Cost-share payments are authorized for afforestation of suitable open land, reforestation, timber stand improvement, and for forest resource management and protection. Unfortunately, FIP has been under-funded for a number of years.

The management of NIPF land is also influenced by federal and state income taxes, which include taxes paid on the income received from the sale of timber. The sale of timber is subject to capital gains tax due to the long-term nature of the investment. The capital gains rate was recently reduced and thus is more favourable to forest revenue than the rate applied to ordinary income. NIPF landowners also benefit from federal tax incentives designed to encourage reforestation.

The management of NIPF land is also influenced by state and local property taxes. Property tax systems for forestland vary by state and in some cases by county within states (Cubbage et al. 1993). Most states tax forestland under some variant of the three major forestland taxation systems, namely ad valorem, productivity and yield taxes. The ad valorem property taxation system, which is commonly used for agricultural land, residential and other properties, is biased against the management of forestland for the production of timber (Klemperer 1996). As a result, many states over the past 20–30 years have changed their taxation system for privately owned forestland to variants of the productivity or yield tax systems. These taxation systems are not only more favourable to the production of timber, but also typically include disincentives to the conversion of forestland to other uses.

Discussion

From the country studies it was difficult to find common structures or policies implemented to support forestry entrepreneurship. This is understandable because the bulk of policies in forestry are aimed for supporting sustainable forest management, wood production and ecological services of the forests rather than entrepreneurship as such. For many forest owners, entrepreneurship is not an issue because they are mostly interested on forest land management for personal or environmental reasons. However, in general the issue of forestry entrepreneurship certainly deserves more in-depth study, beyond what was possible to achieve in this overview paper. An option would be to link future studies to the cultural differences

and institutional characteristics of small-scale forestry, which according to the findings of the current study, may strongly affect the level of forestry entrepreneurship.

According to the available country studies it appears that in forest policy, entrepreneurship has often not been even a primary issue of concern or emphasis, despite its high importance in the societies in general. Forest policies affecting private forest owners' decision-making may, for example, simply aim to increase forest resource growth without much attention on the demand for timber produced (Bull and Ferguson 2006). In industrial enterprises, for comparison, it would be rare to have business plans that aim for higher production without due attention to future product demand.

The available findings from the country studies are now discussed under the study framework presented in Fig. 1.

Demand-side Policies

Policies that affect the demand for forestry entrepreneurship have been widely applied in the countries studied. Most of these policies directly *regulate forestry practices* either to support sustainable forest management or to control some specific problems such as natural forest destruction in the Philippines via the ban on natural forest logging.

To a large extent these policies are necessary to correct market failure and support sustainable forest management. From the entrepreneurship point of view, however, they may also cause additional regulations that can limit the opportunities for forest owners or other forestry enterprises to operate. For example, in Finland the result of strict forest law implementation has been that most forest owners follow rather similar forest management practices, though the owners' objectives considerably differ.

Another interesting feature affecting the demand for forestry entrepreneurship in the study countries is the strong role of *forestry cooperatives*. This strong demand may be explained by at least two factors, viz. co-operatives are aimed at increasing knowledge of forestry practices, and co-operatives have been used to increase the power of small-scale forest owners in negotiations with timber purchasers or forestry administrators. It is notable that forestry cooperatives have been effective in Europe and Japan, but not in the USA, Australia or the Philippines.

Despite its name, the cooperative extension system in the USA is not a landowner co-operative as in many other countries. Rather, it is a partnership among the federal government, the land grant universities, and the states or counties that provides technical assistance and educational opportunities to landowners.

An observation from Finland was that private forest owner associations, aside from being necessary from the abovementioned activities, may also disturb the service markets of private enterprises if the associations have a market advantage due to their obligatory membership fee. Though the importance of private forestry co-operatives cannot be denied even in Finland, a study is warranted of under which

circumstances and without endangering the sustainability of forestry, the same services could be provided by private enterprises.

The third set of policies that affect the demand for forestry entrepreneurship in the study countries was aimed at *increasing the security for investments* in forestry. In Australia, the security improvement was partially implemented via RFAs, which are formal 20-year agreements between the State and Federal Governments related to the allocation of land for native forests and associated industry development. In the Philippines, on the other hand, the need to secure tree tenure was reported as the main obstacle for forestry entrepreneurship development.

Supply-side Policies

An important policy that can increase the supply for forestry entrepreneurship in the study countries is the *provision of information* for forestry enterprises and their representatives. This policy can be implemented via providing various research results, inventory information or reports on possible forestry investment opportunities. In Norway, scholarships are available for people who want to start up new forestry-related enterprises. The scholarships support some training, for example for business planning for the new entrepreneurial activity. In Finland, the question has been raised of whether the research knowledge can be sufficiently utilized for developing new business opportunities, aside from that the information can support the existing enterprises.

Another supply side policy implemented in most study countries is to apply various *programs and campaigns* to support forestry entrepreneurship. These campaigns vary between countries, including campaigns to find employees for forest work in Japan and special programs for promoting the use of wood in Australia.

The third supply side policy to support forestry entrepreneurship is to *increase efficiency in the forestry-wood chain*. In Finland the formation of new joint-owned forest enterprises is aimed for higher forest use among the forest owners who otherwise might have little interest in forestry on relatively small parcels of land. In Japan, a tendency is to merge small private forestry co-operatives to increase their overall efficiency.

Among the study countries, the Philippines and Australia had an objective to build future forest sector development on plantation forests. In both of these countries, policies are designed to encourage *private and public investments to establish new forests*. Similar policies do not appear in other study countries, though forest re-establishment and forest silviculture are supported in the other countries studied as well.

Change in the Risk-reward Profile

The policies that can change the risk profile of investments in forestry are clearly focussed on *public subsidies for forestry* or for *tax incentives* provided for private

forest owners. For example, in Finland, the small-scale forest owners are eligible for state support in forest generation under specific circumstances, prescribed burning, tending of young forests and many other forestry works. In the USA, on the other hand, taxation on timber sales is based on capital taxation which is lower than the average rate of income taxation. Forestry property taxation in the USA is based on yield tax rather than ad valorem tax, which tends to work against timber production objectives.

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